

App. Serial No. 10/544,216
Docket No.: NL030089 US

In the Claims:

Please amend claims 1-2 and 6-7 as indicated below. This listing of claims replaces all prior versions.

1. (Currently Amended) Trench isolation structure, comprising:

a slab of semiconducting material having a surface and a buried layer which extends parallel to the surface, the buried layer having an upper surface and a lower surface; and

a trench groove extending at least from the surface through the buried layer down to a part of the slab below the buried layer and

the trench groove including a liner of a first insulating material on a wall of the trench groove, the liner having a thickness, and

wherein a remaining part of the trench groove is at least partially filled with a first filler material, characterized in that at least in a first part of the trench groove ~~surrounded by the buried layer, the liner has a thickness of the first part of the trench groove that is substantially in line with the upper and lower surfaces of the buried layer and that is larger than the a thickness of the liner~~ in a second part of the trench groove, the second part of the trench groove located below the first part.

2. (Currently Amended) Trench isolation structure according to claim 1, characterized in that the thickness of the liner in the first part of the trench groove is larger than ~~the a thickness of the liner~~ in a third part of the trench groove, the third part of the trench groove located above the first part of the trench groove.

3. (Previously Presented) Trench isolation structure according to claim 1, characterized in that the first part of the trench groove is completely filled with the first insulating material.

4. (Previously Presented) Trench isolation structure according to claim 3, characterized in that the first part of the trench groove extends substantially in line with the buried layer.

App. Serial No. 10/544,216
Docket No.: NL030089 US

5. (*Previously Presented*) Semiconductor assembly, comprising a trench isolation structure according to claim 1, and at least one semiconductor device present on the surface of the slab of semiconducting material, wherein the semiconductor device is insulated by means of the trench isolation structure.

6. (*Currently Amended*) Method for forming a trench isolation in a semiconductor slab, comprising the steps of:

providing a slab of semiconducting material, having a first surface and comprising a buried layer parallel to and below the first surface, the buried layer having an upper surface and a lower surface;

forming a trench groove in the semiconductor slab, the trench groove having a bottom surface and a sidewall, and extending from the first surface through the buried layer and into the slab of semiconducting material;

filling the trench groove at least with a first insulating material and with a first filler material, wherein the first insulating material covers at least the bottom surface and the sidewall in a layer having a thickness d , and wherein the first filler material at least partially fills a remaining part of the trench groove,

characterized in that at least in a first part of the trench groove the first part of the trench groove surrounded by the buried layer, the layer has a thickness of the first part of the trench groove that is substantially in line with the upper and lower surfaces of the buried layer and that is larger than the a thickness of the layer in a second part of the trench groove, the second part of the trench groove located below the first part of the trench groove.

7. (*Currently Amended*) Method according to claim 6, characterized in that the thickness of the layer in the first part of the trench groove is made larger than the a thickness of the layer in a third part of the trench groove, the third part of the trench groove is located above the first part of the trench groove.

App. Serial No. 10/544,216
Docket No.: NL030089 US

8. (*Previously Presented*) Method according to claim 6, characterized in that the step of filling the trench groove comprises the steps of:

covering the bottom surface and the sidewalls of the trench groove with a layer of first insulating material;

filling the trench groove with a first filler material at least to a lower surface level of the buried layer;

removing the first filler material down to a level which is substantially flush with the lower surface level of the buried layer; and

filling the remaining part of the trench groove at least partially with a second insulating material.

9. (*Original*) Method according to claim 8, characterized in that the step of filling the remaining part with the second insulating material is followed by the steps of removing the second insulating material down to a level which is substantially flush with an upper surface level of the buried layer, and filling the remaining part of the trench groove with a second filler material.

10. (*Previously Presented*) Method according to claim 8, characterized in that the step of removing the first filler material or of the second insulating material comprises etching the material.

11. (*Cancelled*).